

### **REMARKS**

Claims 1-32 are currently pending in the application; with claims 1 and 17 being independent. Claims 1-32 were pending prior to the Office Action. In this Reply claims 1 and 17 have been amended.

The Examiner is respectfully requested to reconsider the rejections in view of the amendments and remarks set forth herein. Applicant respectfully requests favorable consideration thereof in light of the amendments and comments contained herein, and earnestly seeks timely allowance of the pending claims.

#### ***Claim Rejections – 35 USC §103***

The Examiner rejected claims 1, 3-14, 16, 17, 19-30 and 32 under 35 U.S.C. § 103(a) as being unpatentable over US Patent Application 2004/0264780 (“Zhang et al.”) in view of US Patent 6,873,713 (“Okazaki et al.”) and publication “View-Based Active Appearance Models” by T.F. Cootes, University of Manchester, Dept. of Imaging Science and Biomedical Engineering, IEEE, 2000 (“T.F. Cootes”). The Examiner rejected claims 2 and 18 under 35 U.S.C. § 103(a) as being unpatentable over Zhang et al., Okazaki et al., and T.F. Cootes and further in view of publication “Growing Gaussian Mixture Models for Pose Invariant Face Recognition”, IEEE, 2000, pp. 1088-1091 (“Ralph et al.”). The Examiner rejected claims 15 and 31 under 35 U.S.C. § 103(a) as being unpatentable over Zhang et al., Okazaki et al. and T.F. Cootes, and further in view of US Patent Application 2002/0122596 (“Bradshaw”). Applicant respectfully traverses these rejections.

Applicant has amended claims 1 and 17. Applicant has amended claim 1 to recite wherein an uncertainty related to the class center is represented by a model associated with the class center. Applicant has also amended claim 17 to recite wherein an uncertainty related to the class center is represented by a model associated with the class center.

To establish a *prima facie* case of obviousness, the Examiner has the burden of meeting the basic criterion that the prior art must teach or suggest all of the claim limitations.

Regarding this basic criterion, the Applicant submits that Zhang et al., Okazaki et al., T.F. Cootes, Ralph et al. and Bradshaw do not disclose or suggest an additive probability model

that models the objects using a class center and residual components between the objects and the class center, wherein an uncertainty related to the class center is represented by a model associated with the class center, as recited in claim 1. Zhang et al., Okazaki et al., T.F. Cootes, Ralph et al. and Bradshaw also do not disclose or suggest an additive probability model that models the objects using a class center and residual components between the objects and the class center, wherein an uncertainty related to the class center is represented by a model associated with the class center, as recited in claim 17.

Zhang et al. discloses systems and methods for annotating a face in a digital image. In one aspect, a probability model is trained by mapping one or more sets of sample facial features to corresponding names of individuals. Facial features are automatically extracted from a detected face. A similarity measure is then modeled as a posterior probability that the facial features match a particular set of features identified in the probability model. The similarity measure is statistically learned. A name is then inferred as a function of the similarity measure. The face is then annotated with the name (Abstract).

Zhang does not disclose or suggest any additive probability model and class center. The Examiner recognized that Zhang does not disclose an additive probability model that models the objects using a class center and residual components between the objects and the class center (page 3 of the Office Action). Zhang also does not disclose that an uncertainty related to a class center is represented by a model associated with the class center.

Paragraph [0083] lines 4-14 in Zhang, for example, does not describe a class center or any model associated with a class center. Paragraph [0083] lines 4-14 states that “to estimate the distributions of intra-personal and inter-personal variations, the operations of block 1004 extract pairs of intra-personal face images and pairs of inter-personal face images from the training data. These difference images are combined together to calculate eigenfaces. The difference images are then projected to the eigenfaces trained from these difference images. In n-dimensional eigenspace, wherein n=the number of reserved eigenfaces, SVM is applied again to derive the posterior probability  $p(\Omega_1 | f(\Delta f))$  of the respective face appearance features”, where  $\Omega_1$  represents the class of intra-personal feature variations. This section of Zhang does not describe a

class center or any model associated with a class center, because  $\Delta f$  represents feature differences between two unidentified faces and is not associated with any class center.

T.F. Cootes does not disclose or suggest an additive probability model that models objects using a class center and residual components between the objects and the class center, wherein an uncertainty related to the class center is represented by a model associated with the class center. While T.F. Cootes mentions a mean shape  $\bar{x}$  on page 228 Section 3 (Applicant does not admit herein that mean shape  $\bar{x}$  is a class center), T.F. Cootes does not disclose or suggest that an uncertainty related to the mean shape  $\bar{x}$  is represented by a model associated with the mean shape  $\bar{x}$ . No model is associated with the mean shape  $\bar{x}$  and no uncertainty related to the mean shape  $\bar{x}$  is mentioned in Cootes. An uncertainty related to the mean shape  $\bar{x}$  is not represented by any model. Hence, T.F. Cootes fails to teach or suggest all elements for claim 1.

Okazaki et al. merely discloses a method to sense a facial image from different directions. Pupil and nasal cavity regions are detected from the sensed facial image, feature points are detected from the detected regions, a feature pattern is extracted on the basis of the feature points, and the feature pattern is registered or is verified with a registered feature pattern to identify a person (Abstract).

Okazaki et al. does not apply each extracted feature to a previously-determined additive probability model to determine the likelihood that an object of interest belongs to an existing class of objects. No additive probability model is mentioned in Okazaki et al. Okazaki et al. also does not disclose or suggest any class center, and does not disclose that an uncertainty related to a class center is represented by a model associated with the class center. Hence, Okazaki et al fails to teach or suggest all of the elements for claim 1 and 17.

Bradshaw merely discloses a technology for semantically classifying areas of an image (and/or the images themselves) as one of a number of multiple discriminating categories. The technology employs one or more hierarchical, probabilistic techniques for performing such classification. The architecture of the technology employs multiple hierarchical layers. The architecture is based on modeling class likelihoods at each of such layers separately and then combining these to form an overall estimate of the posterior, conditioned on the data (Abstract).

Bradshaw does not determine the likelihood that an object of interest belongs to an existing class of objects using a previously-determined additive probability model. An additive probability model is not mentioned anywhere in Bradshaw. Bradshaw also does not disclose or suggest any class center, and does not disclose that an uncertainty related to a class center is represented by a model associated with the class center. Hence, Bradshaw fails to teach or suggest all of the elements for claim 1.

Ralph does not determine a likelihood that an object of interest belongs to an existing class of objects using a previously-determined additive probability model. As explained in the Reply filed on June 3, 2008 and as acknowledged by the Examiner in the present Office Action, Ralph et al. does not teach or suggest an additive probability model that models objects using a class center and residual components between the objects and the class center. Ralph does not disclose any class center, and does not disclose that an uncertainty related to a class center is represented by a model associated with the class center. Hence, Ralph fails to teach or suggest all of the elements for claim 1.

Consequently, the asserted combinations of Zhang et al., Okazaki et al., T.F. Cootes, Ralph et al. and Bradshaw (assuming these references may be combined, which Applicant does not admit) fail to establish *prima facie* obviousness of claim 1 or any claim dependent therefrom. Independent claim 17 and claims depending therefrom define over of Zhang et al., Okazaki et al., T.F. Cootes, Ralph et al. and Bradshaw at least based on reasoning similar to that set forth above.

For all of the above reasons, taken alone or in combination, Applicant respectfully requests reconsideration and withdrawal of the 35 U.S.C. § 103 (a) rejection of claims 1 and 17. Claims 2-16 depend from claim 1 and are allowable at least by virtue of their dependency. Claims 18-32 depend from claim 17 and are allowable at least by virtue of their dependency.

**Conclusion**

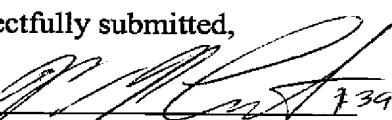
In view of the above amendments and remarks, this application appears to be in condition for allowance and the Examiner is, therefore, requested to reexamine the application and pass the claims to issue.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Corina E. Tanasa, Limited Recognition No. L0292 under 37 CFR §11.9(b), at telephone number (703) 208-4003, located in the Washington, DC area, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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